# MAINTENANCE FACILITY
# ELECTRICAL UPGRADE
## NEWTON, IOWA

IOWA DEPARTMENT OF TRANSPORTATION

### UTILITY COORDINATION NOTES

COORDINATE ALL ELECTRIC UTILITY WORK WITH ALLIANT ENERGY

ALLIANT ENERGY CONTACT:
1-800-255-4268

LOCATE ALL LOCAL UTILITIES IN WORK AREA PRIOR TO STARTING WORK. CONTACT IOWA ONE CALL PRIOR TO DIGGING.

IOWA ONE CALL:
811 or 1-800-292-8989

### ELECTRICAL NOTES - GENERAL

ALL WORK SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF THE 2014 NATIONAL ELECTRIC CODE (NEC).

DETERMINE EXISTING CONDITIONS THAT MAY AFFECT THIS WORK, BY ON-SITE INSPECTION PRIOR TO BIDDING.

LABEL CIRCUIT BREAKER NUMBER & PANEL DESIGNATION ON EACH JUNCTION BOX COVER INSTALLED OR ACCESSED AS PART OF THE WORK.

VERIFY POWER REQUIREMENTS AND EXACT LOCATION OF EQUIPMENT FURNISHED. COMPLY WITH ELECTRICAL ROUGH-IN REQUIREMENTS FOR THIS EQUIPMENT.

ALL CIRCUITS SHALL BE IN CONDUIT AND SHALL INCLUDE AN EQUIPMENT GROUNDING CONDUCTOR, GREEN #12 THHN MINIMUM.

ALL CONDUCTORS SHALL BE COPPER THHN, #12 AWG MINIMUM. INCREASE CONDUCTOR SIZES A MINIMUM OF ONE SIZE OVER NEC TABLE 310-16 IN CIRCUITS WITH A LENGTH OVER 75 FEET.

### ELECTRICAL DEMOLITION NOTES

DEMOLITION OF ALL ELECTRICAL DEVICES, CIRCUITS, AND OTHER MISCELLANEOUS MATERIALS IS TO BE BY THE ELECTRICAL CONTRACTOR.

INCLUDE IN REMOVAL OF CIRCUITS: WIRING, BOXES, CONDUITS, STRAPS, AND OTHER MISCELLANEOUS MATERIALS BACK TO THE BRANCH PANEL OR TO A JUNCTION BOX THAT IS TO REMAIN. CIRCUITS THAT TERMINATE IN A JUNCTION BOX MAY BE LEFT FOR FUTURE USE AFTER MARKING AS NOTED BELOW.

CIRCUITS THAT ARE REMOVED, AND NOT REUSED, SHALL BE DISCONNECTED AT THE CIRCUIT BREAKER IN THE EXISTING PANEL. FOLD OVER ENDS OF WIRE, DOUBLE WRAP WITH UL LISTED BLACK VINYL TAPE, AND TAG TO IDENTIFY TO WHICH JUNCTION BOX THE CIRCUIT IS TERMINATED. LABEL UNUSED CIRCUIT BREAKERS AS "SPARE".

REMOVE DEMOLISHED MATERIALS PROMPTLY FROM THE SITE AND DISPOSE OF PROPERLY.

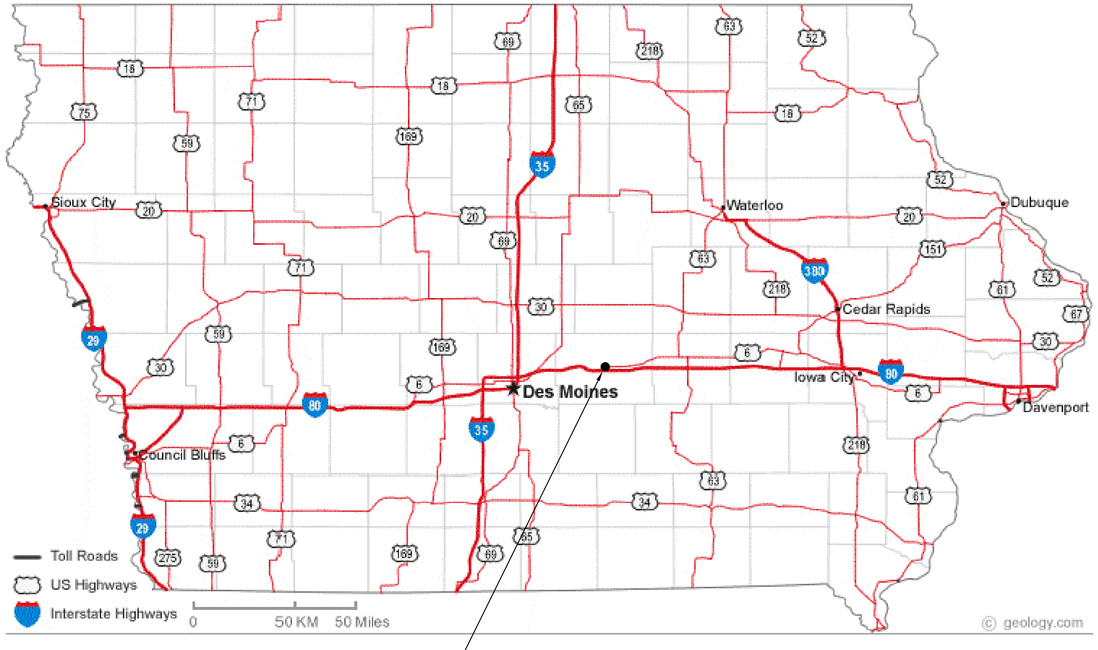
LEAVE OLD CIRCUITS INTACT UNTIL NEW CIRCUITS ARE INSTALLED AND FULLY FUNCTIONAL.

### ELECTRICAL SYMBOLS

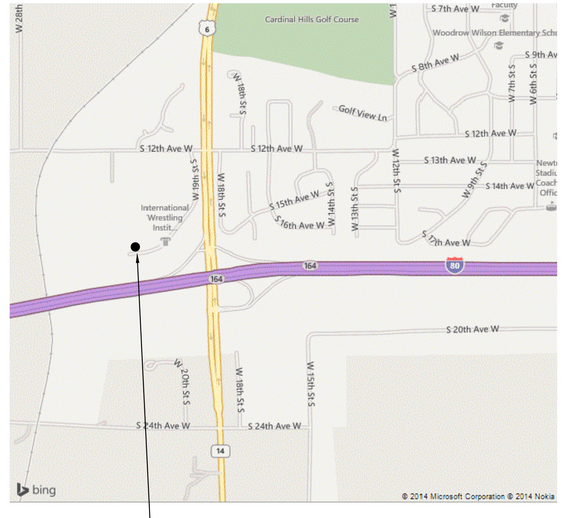
- EXPOSED CONDUIT
  - INDICATES PHASE CONDUCTOR(S)
  - INDICATES NEUTRAL CONDUCTOR
  - INDICATES EQUIPMENT GROUNDING CONDUCTOR
- (5) CIRCUIT KEYED NOTE REFERENCE
- (2) KEYED NOTE REFERENCE
- 1 / E2 DETAIL NUMBER REFERENCE / PAGE NUMBER REFERENCE

### ABBREVIATIONS

APPROX. – APPROXIMATE
BLDG. – BUILDING
CONT. – CONTINUATION
DISC. – DISCONNECT
EJ – EXPANSION JOINT
GALV – GALVANIZED
J-BOX – JUNCTION BOX
NEC – NATIONAL ELECTRICAL CODE
RGS – RIGID GALVANIZED STEEL
SCH – SCHEDULE
TYP – TYPICAL
US – UNDERGROUND SECONDARY ELECTRIC
XFMR – TRANSFORMER




PROJECT LOCATION

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MAINTENANCE FACILITY
ELECTRICAL UPGRADE
NEWTON, IOWA

SHEET TITLE
COVER SHEET

SCALE:
AS NOTED

DRAWN BY:
M.C., R.M.

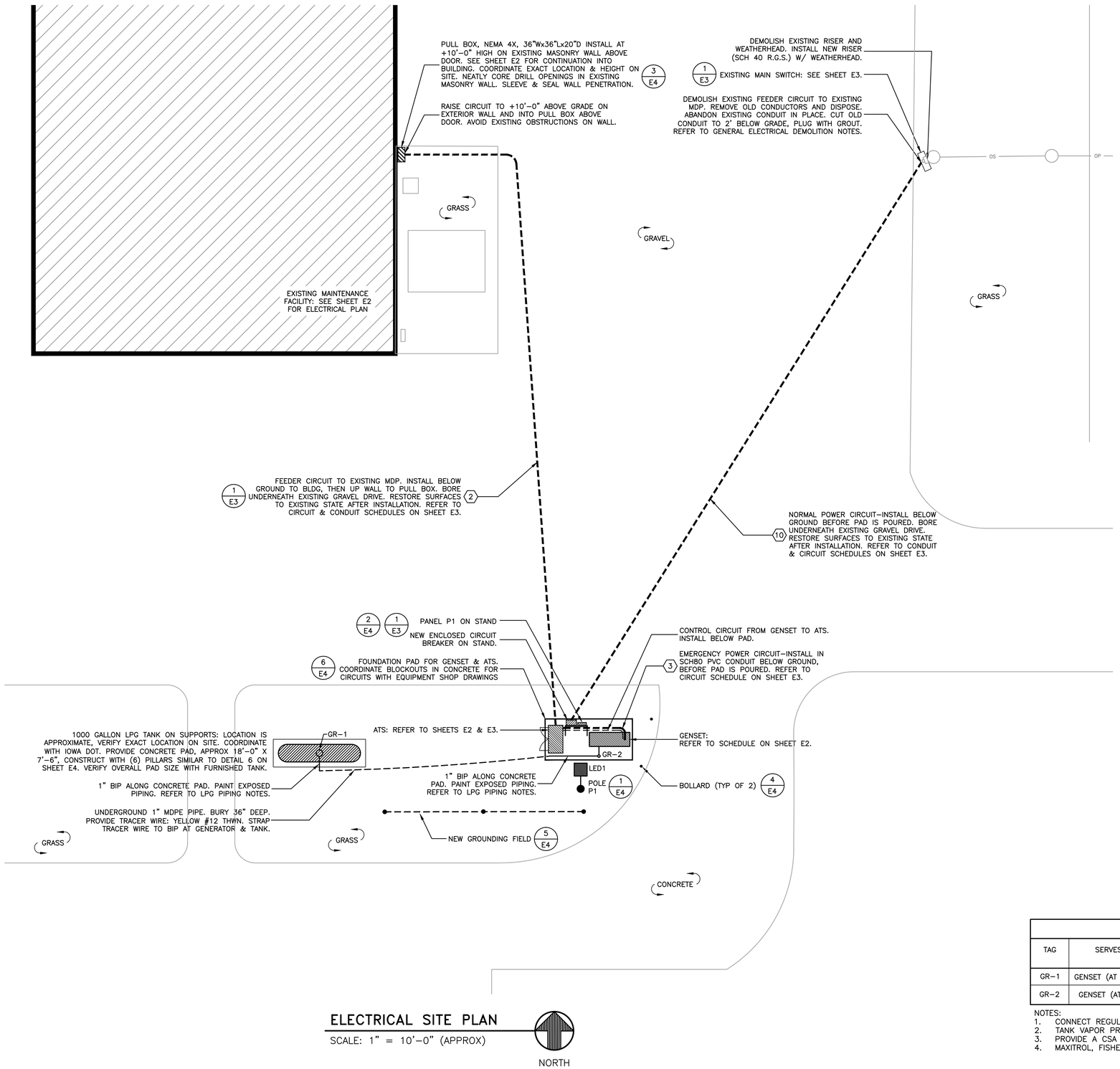
APPROVED:
R.M.

REVISIONS:

DATE:
AUGUST 11, 2014

PROJECT NO.:
ME 1234

SHEET NO.:
CS




## ELECTRICAL SITE PLAN

SCALE: 1" = 10'-0" (APPROX)

NORTH

## GAS REGULATOR SCHEDULE

| TAG | SERVES | MANUFACTURER | PRESSURE | | PIPE SIZE | | 1000 BTU/HR | FLOW RATE (CFH) | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | INLET | OUTLET | INLET | OUTLET | | | |
| GR-1 | GENSET (AT LPG TANK) | (SEE NOTE 4) | (SEE NOTE 2) | 10 PSI | 1" | 1" | 1250 | 500 | 2-4 |
| GR-2 | GENSET (AT GENSET) | (SEE NOTE 4) | 10 PSI | 11" W.C. | 1" | 1" | 1250 | 500 | 1,3-4 |

NOTES:
1. CONNECT REGULATOR TO LPG INLET OF GENERATOR.
2. TANK VAPOR PRESSURE: TYPICALLY 25-100 PSI.
3. PROVIDE A CSA APPROVED BALL GAS SHUTOFF VALVE AT EACH REGULATOR.
4. MAXITROL, FISHER, OR APPROVED EQUAL.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SHEET TITLE
ELECTRICAL SITE PLAN

SCALE: AS NOTED

DRAWN BY: M.C., R.M.

APPROVED: R.M.

REVISIONS:

DATE: AUGUST 11, 2014

PROJECT NO.: ME 1234

SHEET NO.: E1

## GENERATOR SET SCHEDULE

| TAG | POWER RATING | | | | NAMEPLATE RATING (kW) | FUEL | NOTES |
|---|---|---|---|---|---|---|---|
| | VOLTS | PHASE | AMPS | FREQ. | | | |
| GENSET | 240/120 | 1 | 400 | 60 Hz | 100 | NATURAL GAS/LPG | 1–3 |

NOTES:
1. ACCEPTABLE MANUFACTURERS: CATERPILLAR, KOHLER, GENERAC.
2. REFER TO SECTION 16355 FOR ADDITIONAL REQUIREMENTS.
3. GENSET WILL BE INITIALLY FUELED BY LPG ONLY, NATURAL GAS CAPABILITY IS FOR FUTURE USE.

## AUTOMATIC TRANSFER SWITCH SCHEDULE

| TAG | TYPE | MANUFACTURER | MODEL | RATINGS | | | | | ENCLOSURE RATING | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | VOLTS | POLES | AMPS | FREQ. | SCCR | | |
| ATS | AUTOMATIC | ASCO/AMP | 7000 SERIES | 240 | 2 | 400 | 60 Hz | 65kA | NEMA 4X | 1–4 |

NOTES:
1. INCLUDE OPEN TRANSITION MAINTENANCE BYPASS WITHIN ENCLOSURE.
2. REFER TO SECTION 16495 FOR ADDITIONAL REQUIREMENTS.
3. INCLUDE (1) 200A 2P DISTRIBUTION BREAKER FOR PANEL P1.
4. AMP MODEL EQUIVALENT TO ASCO 7000 SERIES.

## LPG PIPING NOTES

SUMMARY OF WORK: PROVIDE A FULLY FUNCTIONAL LPG FUEL PIPING SYSTEM FOR THE GENSET.

COORDINATE WITH GENSET SUPPLIER AND ENSURE PROPANE VAPOR IS DELIVERED AT THE RIGHT PRESSURE AND QUANTITY AS REQUIRED BY THE GENSET.

CODES
AT A MINIMUM, CONFORM TO THE FOLLOWING:
UNIFORM PLUMBING CODE (2012)
NATIONAL FUEL GAS CODE–NFPA 54
INTERNATIONAL FUEL GAS CODE (2012)

PRODUCTS
STEEL GAS PIPING:
STEEL GAS PIPING, ABOVE GROUND AS NOTED ON THE DRAWING: SCHEDULE 40 BLACK STEEL PIPE, ASTM A53, WITH ANSI/ASME B16.3 MALLEABLE IRON FITTINGS AND SCREWED JOINTS.

GAS PIPING UNIONS: BLACK MALLEABLE IRON, GROUND JOINT WITH BRASS SEAT, ANSI B16.39.

MEDIUM DENSITY POLYETHELENE (MDPE) GAS PIPING:
PROVIDE MDPE PIPING FOR UNDERGROUND PIPING AS NOTED ON THE DRAWING. PROVIDE YELLOW TRACER WIRE THROUGHOUT LENGTH.

VALVES
BALL VALVES: 200 PSI WOG @ 150 F, ALL BRASS OR BRONZE, STRAIGHT WAY PLUG, SCREWED, SQUARE HEAD.

PROVIDE VALVES WITH CSA LABEL.

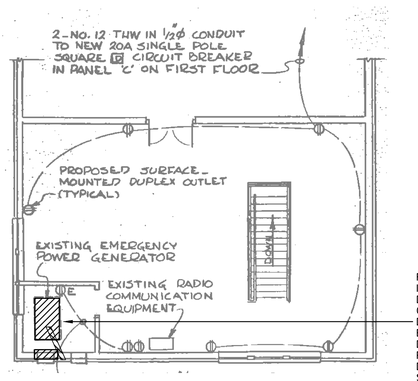
MISCELLANEOUS MATERIALS
INCLUDE MISCELLANEOUS MATERIALS, NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR A COMPLETE AND PROPER INSTALLATION, AS SELECTED BY THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE ENGINEER.

INSTALLATION IN GENERAL:
COMPLY WITH ALL APPLICABLE REQUIREMENTS OF NFPA 54, AND THE INTERNATIONAL FUEL GAS CODE
PROTECT PIPING FROM DIRT BY CAPPING ENDS UNTIL READY TO USE.
SUPPORT PIPING INDEPENDENTLY SO THAT WEIGHT OF PIPE WILL NOT BE SUPPORTED BY THE EQUIPMENT.

EXECUTION
SECURELY ANCHOR ALL EQUIPMENT, HANGERS, AND SIMILAR ITEMS IN PLACE. SUPPORT EACH ITEM INDEPENDENTLY FROM OTHER PIPES. DO NOT USE WIRE OR METAL STRAPS FOR HANGING OR STRAPPING PIPES.
PROVIDE UNION AND SHUT_OFF VALVES SUITABLY LOCATED TO FACILITATE MAINTENANCE AND REMOVAL OF EQUIPMENT AND APPARATUS.
SECURELY MOUNT REGULATORS (REFER TO SECTION 16190).

TESTING NATURAL GAS PIPING SYSTEM:
COMPLY WITH NFPA 54.

SUBMIT A TEST REPORT TO THE ENGINEER.

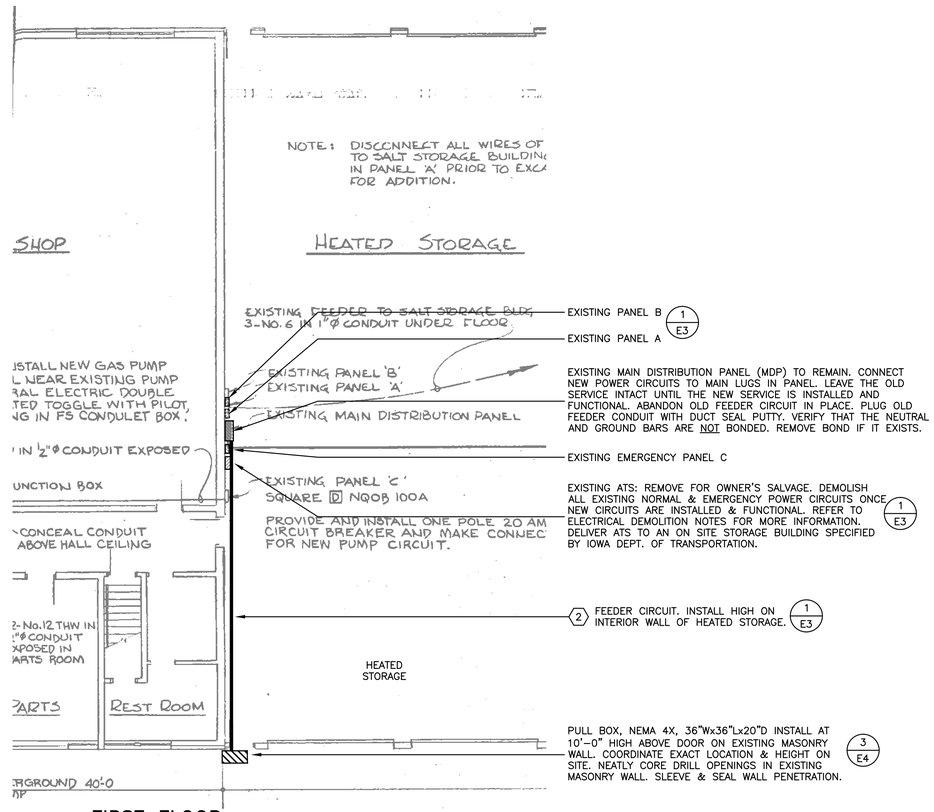



REMOVE AND SALVAGE EXISTING GENERATOR SET, INCLUDING MUFFLER & GAS REGULATOR, FOR OWNER. DEMOLISH EXHAUST PIPING, POWER & CONTROL CIRCUITS TO THE EXISTING ATS, & GAS PIPING. DEMOLISH GAS PIPING BACK TO GAS MAIN & CAP BRANCH AT MAIN. DEMOLISH EXISTING EXHAUST DUCTWORK & MOTORIZED LOUVER AND SEAL WALL PENETRATION CREATED BY REMOVING EXHAUST DUCT. DELIVER GENERATOR TO AN ON SITE STORAGE BUILDING SPECIFIED BY IOWA DEPT. OF TRANSPORTATION.

### SECOND FLOOR ELECTRICAL PLAN

SCALE: 1/8" = 1' (APPROX)

NORTH




EXISTING MAIN DISTRIBUTION PANEL (MDP) TO REMAIN. CONNECT NEW POWER CIRCUITS TO MAIN LUGS IN PANEL. LEAVE THE OLD SERVICE INTACT UNTIL THE NEW SERVICE IS INSTALLED AND FUNCTIONAL. ABANDON OLD FEEDER CIRCUIT IN PLACE. PLUG OLD FEEDER CONDUIT WITH DUCT SEAL PUTTY. VERIFY THAT THE NEUTRAL AND GROUND BARS ARE NOT BONDED. REMOVE BOND IF IT EXISTS.

EXISTING ATS: REMOVE FOR OWNER'S SALVAGE. DEMOLISH ALL EXISTING NORMAL & EMERGENCY POWER CIRCUITS ONCE NEW CIRCUITS ARE INSTALLED & FUNCTIONAL. REFER TO ELECTRICAL DEMOLITION NOTES FOR MORE INFORMATION. DELIVER ATS TO AN ON SITE STORAGE BUILDING SPECIFIED BY IOWA DEPT. OF TRANSPORTATION. (1 / E3)

### FIRST FLOOR ELECTRICAL PLAN

SCALE: 1/8" = 1' (APPROX)

NORTH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NEWTON, IOWA

SHEET TITLE
ELECTRICAL PLAN

SCALE:
AS NOTED

DRAWN BY:
M.C., R.M.

APPROVED:
R.M.

REVISIONS:

DATE:
AUGUST 11, 2014

PROJECT NO.:
ME 1234

SHEET NO.:
E2

## ELECTRIC DISTRIBUTION NOTES

1. FURNISH & INSTALL CIRCUIT BREAKERS AS SHOWN ON PANEL SCHEDULE (TYP).
2. APPLY ANTIOXIDANT PASTE TO ALL CONDUCTORS WHERE THEY CONNECT TO LUGS. TORQUE ALL CONNECTIONS TO VALUES RECOMMENDED BY THE EQUIPMENT MANUFACTURER.
3. BOND NEUTRAL AND GROUND BARS TOGETHER
4. ROUTE GROUNDING CONDUCTORS AS SHORT & DIRECT AS POSSIBLE. MINIMIZE BENDS. MAKE REQ'D BENDS W/ LARGE RADIUS. STRAP CONDUIT TO WALL W/ PVC STRAPS. INSTALL GROUNDING CONDUCTOR IN CONDUIT EVERYWHERE ABOVE GRADE AND BELOW GRADE TO BURIAL DEPTH IN 1" SCH80 PVC.
5. PROVIDE PENETRATION OF EXTERIOR WALL WITH SCH. 40 GALV. STEEL SLEEVE. EXTEND CONDUIT THROUGH EXISTING WALL. FILL AREA BETWEEN SLEEVE AND CONDUIT WITH SPRAY FOAM. APPLY NEAT FILLET OF URETHANE BASED SEALANT AROUND PERIMETER ON BOTH SIDES OF WALL.
6. PROVIDE A 4" RIGID GALVANIZED CONDUIT EXPANSION JOINT FROM AN APPROVED MANUFACTURER.
7. PROVIDE PULL BOX–REFER TO SHEET E1 & E2.
8. CADWELD UFER GROUNDING CONDUCTOR TO REBAR IN CONCRETE PAD.
9. EXISTING METER BY ALLIANT ENERGY TO REMAIN. SHOWN FOR REFERENCE.
10. DEMOLISH EXISTING MAIN SWITCH. REUSE ENCLOSURE AS SPLICE BOX FOR NEW SECONDARY CIRCUITS.
11. VERIFY THAT THE FOLLOWING GROUNDING CONNECTIONS EXIST AT THE EXISTING MDP. REPORT ANY THAT DO NOT EXIST OR ANY UNSAFE CONDITIONS TO THE ENGINEER:
    –MDP GROUNDING BAR BONDED TO COLD WATER PIPE AT WATER SERVICE ENTRANCE.
    –JUMPER ACROSS WATER METER AT WATER SERVICE ENTRANCE.
    –GROUNDING BAR BONDED TO BUILDING STEEL IF APPLICABLE.
    –VERIFY THAT THE NEUTRAL AND GROUND BARS ARE NOT BONDED. REMOVE BOND IF IT DOES EXIST.

## CIRCUIT SCHEDULE

| TAG | CIRCUIT SERVES | # OF SETS | CONDUCTOR INFORMATION | CONDUIT SIZE |
|---|---|---|---|---|
| 1 | NORMAL POWER | (1) | (3) 600 kcmil THWN–2 + (1) #3 AWG THWN–2 E.G.C. | 4" |
| 2 | EXISTING MDP | (1) | (3) 600 kcmil THWN–2 + (1) #3 AWG THWN–2 E.G.C. | 4" |
| 3 | EMERGENCY POWER | (1) | (3) 600 kcmil THWN–2 + (1) #3 AWG THWN–2 E.G.C. | 4" |
| 4 | PANEL P1 | (1) | (3) #3/0 AWG THWN–2 + (1) #6 AWG THWN–2 E.G.C. | 2–1/2" |
| 5 | GENERATOR RECEP. | (1) | (2) #10 AWG THWN–2 + (1) #12 AWG THWN–2 E.G.C. | 1–1/2" |
| 6 | GENERATOR HEATER | (1) | (2) #10 AWG THWN–2 + (1) #12 AWG THWN–2 E.G.C. | WITH ABOVE |
| 7 | GENERATOR BATTERY CHARGER | (1) | (2) #10 AWG THWN–2 + (1) #12 AWG THWN–2 E.G.C. | WITH ABOVE |
| 8 | EXISTING EMERGENCY PANEL C | (1) | (3) #3 AWG THWN–2 + (1) #8 AWG THWN–2 E.G.C. | 1–1/2" |
| 9 | GROUNDING CONDUCTORS | (1) | (1) #2/0 AWG THWN–2 E.G.C. | (4) |
| 10 | ENCLOSED CIRCUIT BREAKER | (1) | (3) 600 kcmil THWN–2 | 4" |

## CONDUIT SCHEDULE

REFER TO SECTION 16110 FOR FITTINGS & ADDITIONAL REQUIREMENTS.

PROVIDE CONDUIT IN THE SIZES SHOWN ON THE CIRCUIT SCHEDULE & OF THE TYPES AS FOLLOWS (UNLESS NOTED OTHERWISE ON DRAWINGS):

BELOW GROUND: SCH80 RIGID PVC

ABOVE GROUND, OUTSIDE: SCH40 RIGID GALVANIZED STEEL

SWEEPS OR ELBOWS, UNDERGROUND: SCH40 RIGID GALVANIZED STEEL

GROUNDING CONDUCTOR, ABOVE GROUND: SCH80 RIGID PVC

ABOVE GROUND, WITHIN THE BUILDING: EMT.

## PANEL P1

LOCATION: EQUIPMENT PAD
ENCLOSURE TYPE: NEMA 4X
INSTALLATION: STAND

VOLTS: 240/120V 1P 3W+G
MAINS RATING: 200A
NEUTRAL: 100%

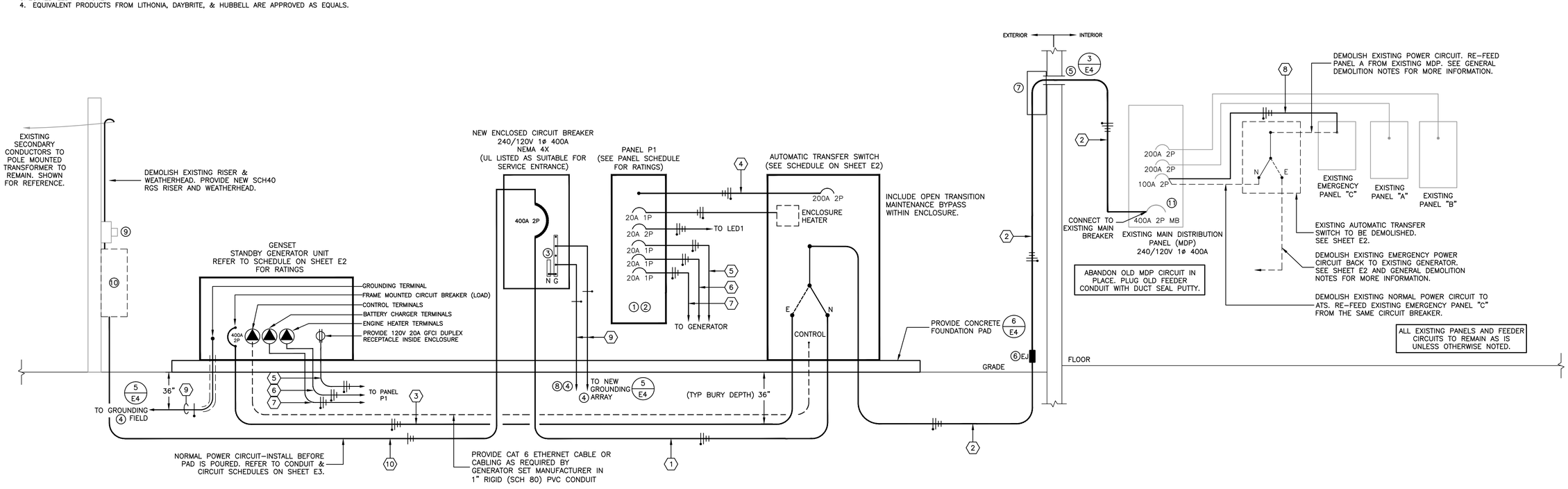
AIC RATING: 10,000
MAIN LUGS ONLY

| CKT. NO. | CIRCUIT BREAKER | LOAD kVA | CIRCUIT DESCRIPTION | CKT. NO. | CIRCUIT BREAKER | LOAD kVA | CIRCUIT DESCRIPTION |
|---|---|---|---|---|---|---|---|
| 1 | 20A/1P | – | GENSET OUTLET | 2 | 20A/2P | – | LED1 |
| 3 | 20A/1P | – | GENSET HEATER | 4 | | | |
| 5 | 20A/1P | – | GENSET BATTERY CHARGER | 6 | 20A/1P | – | SPARE |
| 7 | 20A/1P | – | ATS ENCLOSURE HEATER | 8 | 20A/1P | – | SPARE |
| 9 | 20A/1P | – | SPARE | 10 | 20A/1P | – | SPARE |
| 11 | 20A/1P | – | SPARE | 12 | 20A/1P | – | SPARE |
| 13 | 20A/1P | – | SPARE | 14 | 20A/1P | – | SPARE |
| 15 | 20A/1P | – | SPARE | 16 | 20A/1P | – | SPARE |
| 17 | 20A/1P | – | SPACE | 18 | 20A/1P | – | SPACE |
| 19 | 20A/1P | – | SPACE | 20 | 20A/1P | – | SPACE |
| 21 | 20A/1P | – | SPACE | 22 | 20A/1P | – | SPACE |
| 23 | 20A/1P | – | SPACE | 24 | 20A/1P | – | SPACE |
| 25 | 20A/1P | – | SPACE | 26 | 20A/1P | – | SPACE |
| 27 | 20A/1P | – | SPACE | 28 | 20A/1P | – | SPACE |
| 29 | 20A/1P | – | SPACE | 30 | 20A/1P | – | SPACE |

## LIGHT FIXTURE SCHEDULE

| TAG | FIXTURE TYPE | MANUFACTURER | MODEL | VOLTS | LAMPS | NOTES |
|---|---|---|---|---|---|---|
| LED1 | EXTERIOR LED PARKING LOT FIXTURE | GARDCO | PUREFORM P21–A1–1–5W–130LA–NW–UNIV–BRP–PC | MULTI | 130W LED | 1–2,4 |
| P1 | PARKING LOT LIGHTING POLE (25'–0") | KWI | SSP25–5.0–7–BRZ–DM10–BC | – | – | 3–4 |

NOTES:
1. INCLUDE BUILT–IN PHOTOCELL & PHOTOCELL SWITCH.
2. HOUSING COLOR: DARK BRONZE.
3. INCLUDE BASE COVER, ANCHOR BOLTS, HANDHOLE, GROUNDING LUG, 12" MOUNTING ARMS, & ALL HARDWARE REQUIRED TO INSTALL THE SPECIFIED LED1 FIXTURE.
4. EQUIVALENT PRODUCTS FROM LITHONIA, DAYBRITE, & HUBBELL ARE APPROVED AS EQUALS.




1 ELECTRICAL DISTRIBUTION DIAGRAM
NOT TO SCALE

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MAINTENANCE FACILITY
ELECTRICAL UPGRADE
NEWTON, IOWA

SHEET TITLE
ELECTRICAL DETAILS

SCALE: AS NOTED

DRAWN BY: M.C., R.M.

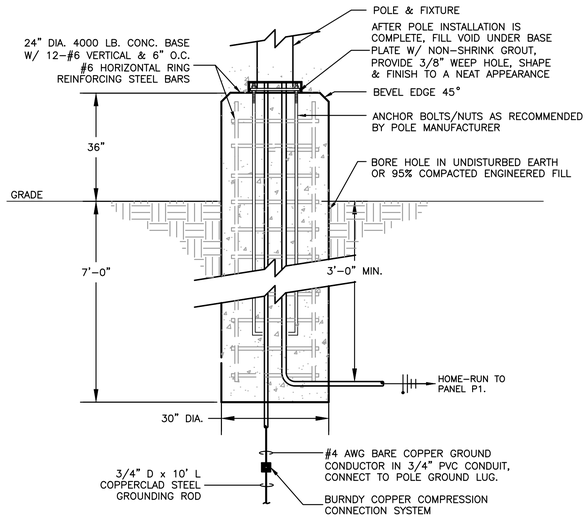
APPROVED: R.M.

REVISIONS:

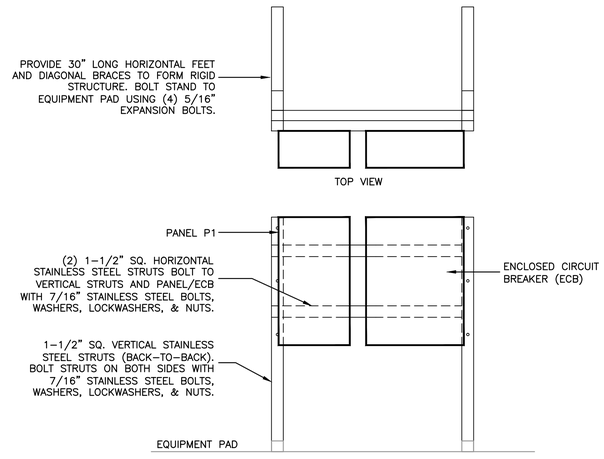
DATE: AUGUST 11, 2014

PROJECT NO.: ME 1234

SHEET NO.: E3




## 1 POLE BASE DETAIL
NOT TO SCALE




## 2 ECB & PANEL P1 STAND DETAIL
NOT TO SCALE

## EQUIPMENT FOUNDATION SUMMARY

CUT EXISTING SOD & SAVE FOR RE-USE-KEEP MOIST. EXCAVATE APPROX. 3 FT. & SAVE SOIL FOR RE-GRADING.

BORE (6) 8"D HOLES 6 FT. BELOW GRADE. PUT 3/4" WASHED LIMESTONE 6" DEEP IN BOTTOM OF EACH HOLE.

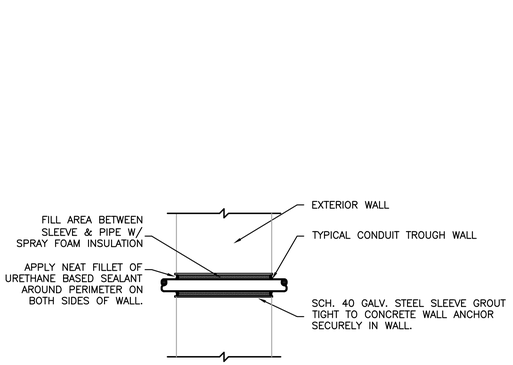
PROVIDE BLOCKOUTS FOR CONDUITS ENTERING EQUIPMENT.

INSTALL BELOW-PAD CONDUITS TO EQUIPMENT AS SHOWN ON THE DRAWINGS.

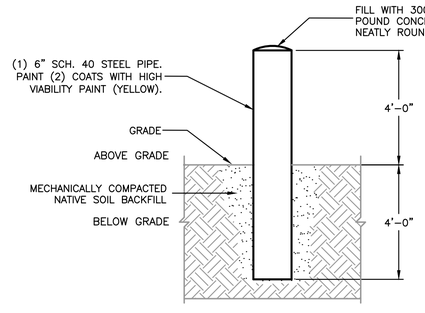
PROVIDE 8" BED OF 3/4" WASHED LIMESTONE IN BOTTOM OF PAD EXCAVATION.

PROVIDE REINFORCED CONCRETE FOUNDATION AS SHOWN BELOW. OVERALL SIZE SHOWN IS APPROXIMATE. COORDINATE EXACT OVERALL SIZE WITH EQUIPMENT SHOP DRAWINGS.

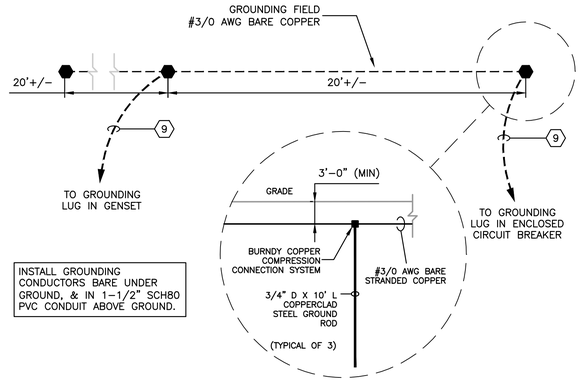
AFTER EQUIPMENT HAS BEEN INSTALLED, FINISH GRADE WITH SLIGHT SLOPE UP TO 4" BELOW TOP OF SLAB. SET REMOVED SOD TO COVER EXPOSED DIRT & WATER.



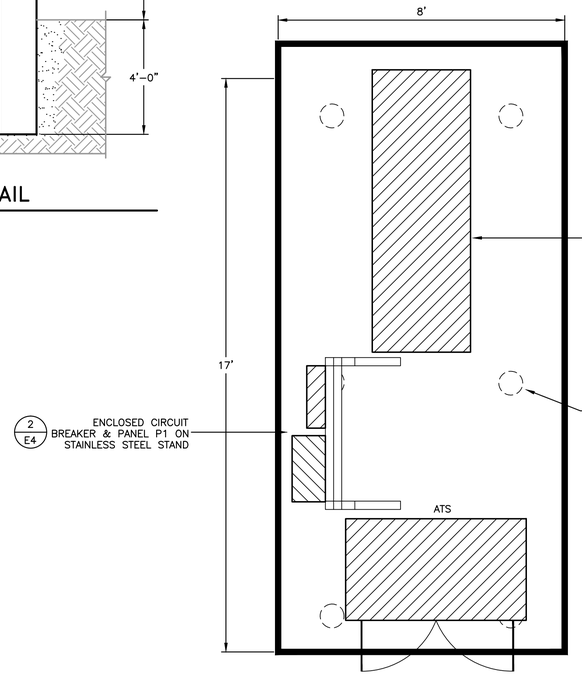

## 3 SLEEVE & SEAL DETAIL - EXTERIOR
NOT TO SCALE

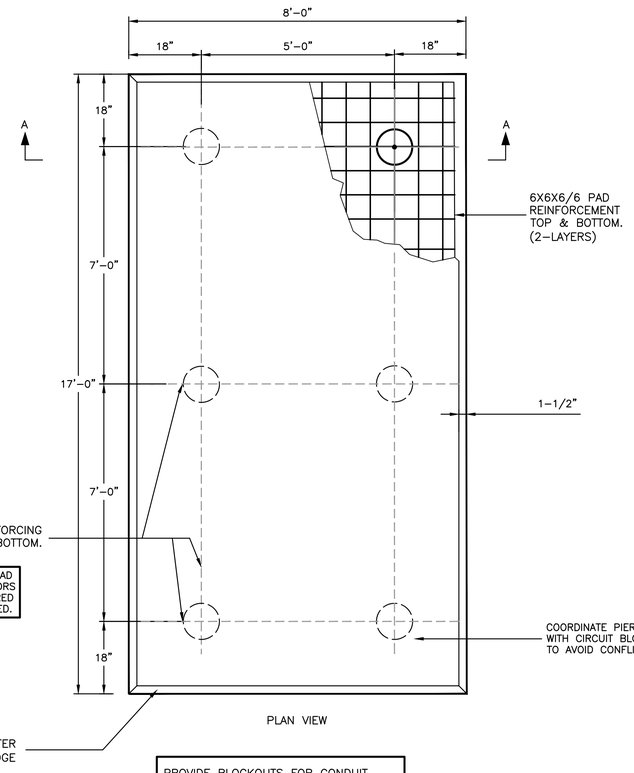



## 4 BALLARD DETAIL
NOT TO SCALE




## 5 GROUNDING ELECTRODE SYSTEM DETAIL
NOT TO SCALE




## 6 ATS & GENERATOR SET PAD DETAIL
NOT TO SCALE

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DRAWN BY: M.C., R.M.

APPROVED: R.M.

REVISIONS:

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PROJECT NO.: ME 1234

SHEET NO.: E4